REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 3, 6, 9, and 14 have been canceled without prejudice or disclaimer, claims 1, 5, 13 and 17 have been amended, and new claim 21 has been added. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-2, 4-5, 7-13, and 15-21 are pending and under consideration. Reconsideration is respectfully requested.

DUPLICATE CLAIMS OBJECTION:

The Examiner objected to claim 14 as being a substantial duplicate of claim 18.

Claim 14 has been cancelled. Thus, this objection is overcome.

REJECTION UNDER 35 U.S.C. §103:

A. In the Office Action, at pages 2-4, numbered paragraph 3, claims 1, 3-6, 8-10, 12-14, 16-18 and 20 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ishibe (USPN 6,489,982; hereafter, Ishibe) in view of Mclaughlin et al. (USPN 4,758,071; hereafter, Mclaughlin). The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Independent claims 1, 5, and 13 have been amended to add the features of claims 3, 6, and 14, respectively. Claims 3, 6 and 14 have been cancelled without prejudice or disclaimer.

Thus, independent claims 1, 5, 9, and 13 now recite that the collimating lens is glass.

In addition, independent claims 1, 5, 9, 13 and 17 have been amended to recite that the first surface of the collimating lens has "a first positive constant refractive index " and that the second surface of the collimating lens has "a second positive constant refractive index." It is respectfully submitted that the added terminology is supported by Table 1 on page 5 and paragraph [0016] of the specification.

The Examiner admits: "Ishibe is silent regarding the collimator lens being made of one sheet of a spherical surface lens, the collimator lens being made of glass," which is recited in independent claims 1, 5, 9, and 13 of the present invention. Ishibe only discloses a conventional collimating lens used in a scanning optical system, which is typically constructed of one sheet of a spherical surface lens and one sheet of an aspherical surface lens.

Mclaughlin teaches utilizing an "oxide glass plate containing at least a kind of monovalent cations," and thus achieves an index distribution decreasing gradually and evenly from the surface to the inside of the glass plate, as is recited in col. 3, line 60 through col. 4, line 9 of

Mclaughlin:

> Next, a suitable method of making a collimator lens of the invention will be described with reference to FIGS. 9A through 9D. (emphasis added)
>
> An oxide glass plate 10 containing at least a kind of monovalent cations is used as a base material, which is dipped in a molten salt 11 at a temperature near the transition temperature of the glass as shown in FIG. 9A. The molten salt contains monovalent cations to increase the refractive index of the glass material, for example, at least a kind of cations selected from the group of Li ions, Cs ions, Tl ions and Ag ions. (emphasis added)
>
> In the dipping process, the cations of the molten salt are diffused into the glass plate from both surfaces thereof by ion-exchanging with the cations of the glass plate. As the result, as shown in FIG. 9B, an index distribution 12 decreasing gradually and evenly from the surface to the inside of the glass plate 10 is established by an ion concentration distribution. (emphasis added)

In col. 4, lines 26-29, Mclaughlin recites that the glass must be processed to contain at least a kind of monovalent cations:

> A glass plate subjected to the above-mentioned ion-exchange process **must** contain at least a kind of monovalent cations and have a high refractive index within the range of 1.50 to 1.77. (emphasis added)

It is respectfully submitted that processing glass to incorporate monovalent cations changes the characteristics of the glass, increasing the refractive index of the glass (see col. 2, lines 13-25, Mclaughlin). Hence, Mclaughlin teaches away from independent claims 1, 5, 9, and 13 of the present invention, which do not recite utilizing a process to diffuse at least a kind of monovalent cations into the glass plate. The present claimed invention does not recite treating the glass with monovalent cations to provide an index-varying region in which the refractive index varies in the axial direction. For clarity, independent claims 1, 5, 9, 13 and 17 have been amended as recited above to show more clearly that, in contrast, in the present claimed invention, the first surface of the collimating lens has "a first positive constant refractive index " and that the second surface of the collimating lens has "a second positive constant refractive index."

Claim 17 of the present invention is utilized with a laser printer with resolution ranging from 300 dots per inch or 600 dots per inch. The lens of the present invention has a constant refractive index, as is set forth more clearly in amended independent claims 1, 5, 9, 13 and 17 of the present invention, whereas Mclaughlin relates to a gradient index (GRIN) lens, the refractive index of which changes along the Z axis. Ishibe teaches (see claim 1) a multi-beam scanning optical system wherein letting S1 be an emission point interval between the plurality of light sources in the main scanning direction sources in the main scanning direction, f1 be a focal length of said first optical system, L1 be a distance from said stop to the deflecting surface of said deflection means, f3 be the focal length of said second optical system in the main scanning

direction, and N1 be the number of pixels per inch on the scanned surface in the main scanning direction, a condition given by

$$\frac{S1xL1}{f1xf3} \leq \frac{25.4}{N1} \times \frac{1}{4}.$$

Hence, claim 17 of the present invention is not taught or suggested by Ishibe and/or Mclaughlin, alone or in combination.

Thus, even if combined, Ishibe and Mclaughlin do not teach or suggest independent claims 1, 5, 9, 13 and/or 17 of the present invention. Hence, independent claims 1, 5, 9, 13 and 17 are submitted to be patentable under 35 U.S.C. §103(a) over Ishibe (USPN 6,489,982) in view of Mclaughlin et al. (USPN 4,758,071). Since claims 3-4, 6, 8, 10, 12, 14, 16, 18 and 20 depend from claims 1, 5, 9, 13, and 17, respectively, claims 3-4, 6, 8, 10, 12, 14, 16, 18 and 20 are patentable under 35 U.S.C. §103(a) over Ishibe (USPN 6,489,982) in view of Mclaughlin et al. (USPN 4,758,071) for at least the reasons that claims 1, 5, 9, 13, and 17are patentable under 35 U.S.C. §103(a) over Ishibe (USPN 6,489,982) in view of Mclaughlin et al. (USPN 4,758,071).

B. In the Office Action, at pages 4-5, numbered paragraph 4, claims 2, 7, 11, 15, and 19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ishibe (USPN 6,489,982; hereafter, Ishibe) in view of Mclaughlin et al. (USPN 4,758,071; hereafter, Mclaughlin) as applied to claims 1, 5, 9, 13 and 17 above, and further in view of Naiki (USPN 6, 172,787; hereafter, Naiki). The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

The Examiner admits that Ishibe, as modified by Mclaughlin, does not disclose a collimator lens having a positive refractive power, as is disclosed in independent claims 1, 5, 9, 13 and 17 of the present invention.

In claim 1, Naiki recites:

A laser beam scanning optical apparatus comprising:
a laser diode array which has a plurality of light emitting sources which are arranged two-dimensionally in a first direction and in a second direction perpendicular to the first direction on a wafer, wherein adjacent light emitting sources in the first direction have an interval of a first dimension and adjacent light emitting sources in the second direction have an interval of a second dimension, wherein said first dimension is different from said second dimension and a relationship between said first dimension and said second dimension is defined by the equation:

$$P_2/P_1=m(\tan\Theta)$$

wherein
P_2 is said second dimension,
P_1 is said first dimension,
m is a number of light emitting sources in each line of light emitting sources in said first direction, and
Θ is an angle between said first direction and a main scanning direction;

a deflector which deflects a plurality of laser beams emitted from the laser diode array; and

a scanning system which images the plurality of laser beams emitted from the laser diode array on a scanning surface, the scanning system having a magnification ratio in said main scanning direction in which the deflector deflects the plurality of laser beams and a magnification ratio in a sub scanning direction perpendicular to the main scanning direction, the magnification ratio in the main scanning direction and the magnification ratio in the sub scanning direction being different. (emphasis added)

Hence, Naiki requires a plurality of light emitting sources arranged two-dimensionally in a first direction at uniform intervals of P_1 and in a second direction perpendicular to the first direction at uniform intervals of P_2 which is different from P_1. In addition, in the laser beam scanning optical apparatus, the magnification ratio in the main scanning direction and the magnification ratio in the sub scanning direction are different from each other.

As recited in Naiki, col. 5, line 46 through col. 6, line 4:

As FIG. 5 shows, the laser diode array 1 has light emitting sources 21 arranged latticedly in a direction of "i" at uniform intervals of P_1 and in a direction of "j" perpendicular to the "i" direction at uniform intervals of P_2 ($P_1 < P_2$). There are arranged m light emitting sources in each line extending in the "i" direction, and there are arranged n light emitting sources in each line extending in the "j" direction. The "i" direction is at an angle Θ expressed by the following expression (1) to the main scanning direction (denoted by "x" in FIG. 5). Thereby, the light emitting sources 21 are arranged apparently at uniform and small intervals in the sub scanning direction (denoted by "y" in FIG. 5). (emphasis added)

Accordingly, compared with a conventional scanning optical apparatus which employs a linear laser diode array and a scanning optical apparatus in which the laser diode array 1 is arranged in such a way that the "i" direction is parallel to the main scanning direction (Θ=0), the scanning optical apparatus of this embodiment does not require the collimator lens 2 to have so large an effective diameter. This also inhibits aberration caused by the collimator lens 2. Further, in the scanning optical apparatus, the angle of view when the laser beams are emergent from the collimator lens 2 is small, and shifts of the dots in the main scanning direction on the photosensitive drum 30 are small. (emphasis added)

Thus, Naiki requires a plurality of light emitting sources arranged latticedly in a direction of "i" at uniform intervals of P_1 and in a direction of "j" perpendicular to the "i" direction at uniform intervals of P_2 ($P_1 < P_2$), which is a different arrangement with different characteristics from the linear laser diode array and scanning optical apparatus in which the laser diode array is arranged in such a way that the "i" direction is parallel to the main scanning direction (Θ=0), as is disclosed in independent claims 1, 5, 9, 13 and 17 of the present invention (see FIG. 1 of the present invention).

In addition, it should be noted that Naiki requires that a magnification ratio in the main scanning direction and a magnification ratio in the sub scanning direction be different (see claim 1, Naiki). For clarity, independent claims 1, 5, 9, 13 and 17 of the present invention have been amended to show that, in the present claimed invention, a magnification ratio in a main scanning direction and a magnification in a sub scanning direction are substantially the same. The amendment of claims 1, 5, 9, 13 and 17 to recite said terminology is supported by the data in FIG. 5 of the present invention.

Hence, Naiki teaches away from the present invention, and away from Ishibe and Mclaughlin, which also utilize a laser diode array that is arranged in such a way that the "i" direction is parallel to the main scanning direction (Θ=0). Naiki is utilizing a combining technique and apparatus for a plurality of light emitting diodes arranged differently from Ishibe, Mclaughlin and the present invention to achieve a different result (a minimized diameter for the colliminating lens) and is utilizing a magnification ratio in the main scanning direction and a magnification ratio in the sub scanning direction that are different, whereas in the present claimed invention, said magnification ratios are substantially the same.

One cannot simply pick and choose certain elements of certain inventions, using the present invention as a blueprint, to put the elements together to obtain the present invention: In Ruiz and Foundation v. A.B. Chance Company, 69 USPQ2d 1690 (CAFC January 29, 2004), the court held:

> In making the assessment of differences, section 103 specifically requires consideration of the claimed invention "as a whole." Inventions typically are new combinations of existing principles or features. Envtl. Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698 (Fed. Cir. 1983) (noting that "virtually all [inventions] are combinations of old elements."). The "as a whole" instruction in title 35 prevents evaluation of the invention part by part. Without this important requirement, an obviousness assessment might break an invention into its component parts (A + B + C), then find a prior art reference containing A, another containing B, and another containing C, and on that basis alone declare the invention obvious. This form of hindsight reasoning, using the invention as a roadmap to find its prior art components, would discount the value of combining various existing features or principles in a new way to achieve a new result – often the very definition of invention.
>
> Section 103 precludes this hindsight discounting of the value of new combinations by requiring assessment of the invention as a whole. This court has provided further assurance of an "as a whole" assessment of the invention under § 103 by requiring a showing that an artisan of ordinary skill in the art at the time of invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would select the various elements from the prior art and combine them in the claimed manner. In other words, the examiner or court must show some suggestion or motivation, before the invention itself, to make the new combination. See In re Rouffet, 149 F.3d 1350, 1355-56 (Fed. Cir. 1998).

Hence, even if combined, Ishibe, Mclaughlin and Naiki do not teach independent claims 1, 5, 9, 13, and 17, at least in part because Naiki teaches away from the present invention by teaching using a laser diode array that has light emitting sources arranged latticedly in a direction of "i" at uniform intervals of P_1 and in a direction of "j" perpendicular to the "i" direction at uniform intervals of P_2 ($P_1 < P_2$) and in part because Naiki is utilizing a magnification ratio in the main scanning direction and a magnification ratio in the sub scanning direction that are different, whereas in the present claimed invention, said magnification ratios are substantially the same.

Thus, it is respectfully submitted that independent claims 1, 5, 9, 13, and 17 are

patentable under 35 U.S.C. §103(a) over Ishibe (USPN 6,489,982) in view of Mclaughlin et al. (USPN 4,758,071) as applied to claims 1, 5, 9, 13 and 17 above, and further in view of Naiki (USPN 6, 172,787). Since claims 2, 7, 11, 15, and 19 depend from claims 1, 5, 9, 13, and 17, respectively, claims 2, 7, 11, 15, and 19 are patentable under 35 U.S.C. §103(a) over Ishibe (USPN 6,489,982) in view of Mclaughlin et al. (USPN 4,758,071) as applied to claims 1, 5, 9, 13 and 17 above, and further in view of Naiki (USPN 6, 172,787) for at least the reasons that claims 1, 5, 9, 13 and 17 are patentable under 35 U.S.C. §103(a) over Ishibe (USPN 6,489,982) in view of Mclaughlin et al. (USPN 4,758,071) as applied to claims 1, 5, 9, 13 and 17 above, and further in view of Naiki (USPN 6, 172,787).

COMMENTS ON RESPONSE TO ARGUMENTS:

In the Office Action, at pages 5-6, numbered paragraph 5, the Examiner provided a response to Applicant's arguments.

The Examiner submits: "In this case, Mclaughlin et al. clearly provides a motivation for using a collimating lens made out of a single sheet of glass with reduced spherical aberration for cost effective purpose as compared to the use of a compound lens consisting of plural spherical lenses." However, as pointed out above, in col. 4, lines 26-29, Mclaughlin recites that the glass must be processed to contain at least a kind of monovalent cations:

> A glass plate subjected to the above-mentioned ion-exchange process **must** contain at least a kind of monovalent cations and have a high refractive index within the range of 1.50 to 1.77. (emphasis added)

Hence, Mclaughlin teaches away from independent claims 1, 5, 9, 13 and 17 of the present invention, which do not recite glass having at least a kind of monovalent cations.

It is respectfully submitted that the statement "Moreover, Ishibe teaches an error correction in the focused light beams on the surface to be scanned largely due Such focus error would be minimized with the use of a well designed/manufactured optical system" is a conclusory statement, supported only by the Examiner's statement. The Examiner is required to present actual evidence and make particular findings related to the motivation to combine the teachings of the references. In re Kotzab, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence." Dembiczak, 50 USPQ2d at 1617. "'The factual inquiry whether to combine the references must be thorough and searching.'" In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) (citing McGinley v. Franklin Sports, Inc., 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)). The factual inquiry must be based on objective evidence of record, and cannot be based on subjective belief and unknown authority. Id. at 1433-34. The Examiner must explain the reasons that one of ordinary skill in the art would

have been motivated to select the references and to combine them to render the claimed invention obvious. In re Rouffet, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998).

It is respectfully submitted that the statement "Moreover, Ishibe teaches an error correction in the focused light beams on the surface to be scanned largely to the positional error between the scanning optical system and the scanned surface, and the error correction requires adequate positioning of the different optical components. Such focus error would be minimized with the use of a well designed/manufactured optical system" is a conclusory statement, submitted without support.

It appears that the Examiner is essentially relying on common knowledge or common sense as a basis for establishing the obviousness of claims 1-20. Common knowledge or common sense are not a basis for establishing obviousness under 35 U.S.C. §103(a). In In re Lee, 277 F. 3d, 1338, 1341, 61 USPQ2d 1430, 1432 (Fed. Cir. 2002), the Board held that:

> The Examiner is required to present actual evidence and make particular findings related to the motivation to combine the teachings of the references. In re Kotzab, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Broad conclusory statements regarding the teaching of multiple references, standing alone, are not "evidence." Dembiczak, 50 USPQ2d at 1617. "'The factual inquiry whether to combine the references must be thorough and searching.'" In re Lee, 61 USPQ2d 1430, 1433 (Fed. Cir. 2002) (citing McGinley v. Franklin Sports, Inc., 60 USPQ2d 1001, 1008 (Fed. Cir. 2001)). The factual inquiry must be based on objective evidence of record, and cannot be based on subjective belief and unknown authority. Id. at 1433-34.

The Examiner must explain the reasons that one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious. In re Rouffet, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998).

In In re Lee, 277 F. 3d, 1338, 1341, 61 USPQ2d 1430, 1432 (Fed. Cir. 2002), the Board held:

> The foundation of the principle of judicial deference to the rulings of agency tribunals is that the tribunal has specialized knowledge and expertise, such that when reasoned findings are made, a reviewing court may confidently defer to the agency's application of its knowledge in its area of expertise. Reasoned findings are critical to the performance of agency functions and judicial reliance on agency competence. See Baltimore and Ohio R. R. Co. v. Aberdeen & Rockfish R. R. Co., 393 U.S. 87, 91-92 (1968) (absent reasoned findings based on substantial evidence effective review would become lost "in the haze of so-called expertise"). The "common knowledge and common sense" on which the Board relied in rejecting Lee's application are not the specialized knowledge and expertise contemplated by the Administrative Procedure Act. Conclusory statements such as those here provided do not fulfill the agency's obligation. This court explained in Zurko, 258 F.3d at 1385, 59 USPQ2d at 1697, that "deficiencies of the cited references cannot be remedied by the Board's general conclusions about what is 'basic knowledge' or 'common sense.'" The Board's findings must extend to all material facts and must be documented on the record, lest the "haze

> of so-called expertise" acquire insulation from accountability. "Common knowledge and common sense," even if assumed to derive from the agency's expertise, do not substitute for authority when the law requires authority. See Allentown Mack, 522 U.S. at 376 ("Because reasoned decisionmaking demands it, and because the systemic consequences of any other approach are unacceptable, the Board must be required to apply in fact the clearly understood legal standards that it enunciates in principle . . . .")

Hence, it is submitted that there is no basis presented for combining the cited references, and the Applicants respectfully request the withdrawal of the §103(a) rejections of the claims based on the cited references.

NEW CLAIM:

New claim 21 recites that the features of claim 17 of the present invention further include that the collimating lens is glass. Nothing in the prior art teaches or suggests such. It is submitted that this new claim distinguishes over the prior art.

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited. At a minimum, this Amendment should be entered at least for purposes of Appeal as it either clarifies and/or narrows the issues for consideration by the Board.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited and possibly concluded by the Examiner contacting the undersigned attorney for a telephone interview to discuss any such remaining issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

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